



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/799,905

03/12/2004

Thomas J. O'Keefe

31550-1001

8305

5179 7590 12/28/2007
PEACOCK MYERS, P.C.
201 THIRD STREET, N.W.
SUITE 1340
ALBUQUERQUE, NM 87102

EXAMINER

LEADER, WILLIAM T

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

12/28/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/799,905	Applicant(s) O'KEEFE ET AL.	
	Examiner William T. Leader	Art Unit 1795 ₃	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 November 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6, 8-11, 13-19, 25, 27, 39, 42, 44 and 46-49 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 8-11, 13-19, 25, 27, 39, 42, 44 and 46-49 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Receipt of the papers filed on October 11, 2007, is acknowledged. Claims 7, 12, 20-24, 26, 28-38, 40, 41, 43 and 45 have been canceled. Claims 1-6, 8-11, 13-19, 25, 27, 39, 42, 44 and 46-49 are pending.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 112

3. Claims 1-6, 8-11, 13-19, 25, 27, 39, 42, 44 and 46-49 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
4. The number of separate deposition steps required by claim 1 remains unclear. Claim 1 recites a step of providing an organic solution with a desired deposition component. As noted in the previous office action, claim 1 also recites a step of seeding the deposition substrate with a seed composition. This seeding step is performed with a seed composition comprising a more noble composition than a less noble deposition substrate. It is not clear if there is any relationship between the organic solution recited in line 13 and the step of forming the seed layer. The specification does not clarify this question. Page 11, lines 7-15 describe figures 2a-

2c. The figures show a copper substrate 22. Over the copper is nickel seed layer 20 (page 11, line 11). The nickel seed layer is coated with gold from a solution containing gold complexed with an organic compound. The solution containing the gold appears to correspond to the organic solution of claim 1. However, there appears to be no relationship between the formation of the nickel seed layer and the gold-containing organic solution. Applicant's Remarks have been considered but do not clarify the scope of claim 1. Is the "seed composition" recited in line 6 related to the "deposition component" recited in line 4? If so, how?

5. As stated at page 10, lines 1-2 of the specification, figures 1a-1c illustrate the process of the present invention for deposition of more noble metals from an organic solution onto a less noble metal substrate. Figures 1a-1c are described at pages 10 and 11 of the specification. Gold from a solution deposits onto a less noble substrate. No seed layer is mentioned or illustrated. As written claim 1 requires a step of seeding. It is not clear if the process illustrated in figures 1a-1c included within the scope of claim 1, since it appears that no seed layer is involved.

6. At page 9 of the Remarks, applicant states that if the seed does not entirely cover the substrate, then the deposition component will form a second layer in some areas, and will not form a second layer in other areas. This suggests that the seed layer is not required for formation of a layer of the deposition component and that the deposition component will form a layer even in areas where the seed layer is not

present. By what mechanism is the layer of deposition component formed in areas where the seed layer is not present. Does this mechanism differ from areas where the seed layer is present?

7. At page 9, lines 18-19 of the Remarks, applicant refers to page 12, lines 7-8 of the specification which relate to electroless deposition. As noted at page 12, lines 8-9, an electroless plating solution contains a reducing agent and a metal to be deposited. A seed layer acts as a catalytic surface which facilitates reduction of the metallic species in the solution to a metal deposit on the surface. The Lowenheim text *Electroplating* is cited to show the basics of electroless (autocatalytic) plating. See pages 389-409. Are applicant's comments intended to indicate that the claimed process is an electroless plating process in which the solution from which deposition takes place includes a reducing agent?

8. Page 10, lines 11-14 indicate that the present invention comprises a process for deposition of components utilizing electrochemical displacement. Similarly, page 15, line 10 states that in principle, the galvanic coating process of the present invention is a cementation reaction. A displacement (cementation) coating process is a different process than electroless coating and is explained at pages 410-415 of the Lowenheim text. It does not appear that applicant's claimed process using the organic solution can be both an electroless process and a displacement (cementation) process.

9. It remains unclear how it is determined whether the materials which are included within the scope of claim 1 are more or less noble. In the Remarks, applicant points to www.corrosionsource.com. The table presented at this site corresponds to the tables found in general electrochemical texts and shows the potentials of metals and metal alloys relative to a standard hydrogen electrode. Claim 1 recites a "deposition substrate" and that the "deposition substrate" is "less noble". Page 7, lines 11-12 indicate that the deposition substrate may be a tungsten-based, tantalum-based or titanium-based composition. Claim 9 recites a similar limitation. Page 7, line 13 indicates that the composition may be a nitride. The table at www.corrosionsource.com does not provide data for these compositions. It is requested that applicant provide a source of data for the potentials of compositions commensurate in scope with the compositions recited in claim 1. Without such data, it is not apparent how the determination of what is more or less noble can be made.

10. Claim 1 new recites a substrate with a barrier layer. It appears that the barrier layer is on top of and covers at least a part of the substrate. The step of seeding recites that the seed composition comprises a more noble composition than a less noble deposition substrate. If the substrate is covered by a barrier layer, why is the relative potential (i.e., more or less noble) of the substrate germane? It appears that it is the barrier layer on which the seeding occurs that should be less

noble. Will seeding occur on a barrier layer which is more noble than the seed composition?

11. Claim 1 has been amended to recite a “poorly electrically conducting” organic solution. The scope of this limitation is not clear. The expression has not been defined in the specification. Claim 1 has additionally been amended to recite that the organic solution is “polarizing”. It is noted that at page 12, lines 19-20 of the specification, applicant states that “organic solutions are very polarizing”. Does this indicate that all organic solutions are polarizing? If not, it is not clear what criteria are used to determine whether a solution is polarizing and would fall within the scope of claim 1.

Claim Objections

12. Claim 8 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. With respect to claim 8, it appears that a material is either a metal or a non-metal.

Claim Rejections - 35 USC § 102

13. Claims 1-6, 8, 9, 11, 13, 15-18, 25, 39, 42, 44, 46, 47 and 49 are rejected under 35 U.S.C. 102(b) as being anticipated by Miura et al (5,302,256) for the reasons of record and in view of the following comments.

Claim Rejections - 35 USC § 103

14. Claims 10 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miura et al (5,302,256) in view of Zhao et al (5,660,706) for the reasons of record and in view of the following comments.

15. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miura et al (5,302,256) in view of the Lowenheim text *Modern Electroplating* for the reasons of record and in view of the following comments.

16. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miura et al (5,302,256) in view of Stouffer et al (US 2004/0249023) for the reasons of record and in view of the following comments.

17. Applicant's Remarks have been carefully considered but are not deemed to be persuasive. At page 12 of the Remarks, applicant argues that Miura et al does not teach an organic solution, but teaches a plating bath than contains organic acids. This argument is not convincing. Applicant's specification discloses that water may be an additive (page 8, lines 20-21). Thus, the solution recited in claim 1 may

include both an organic solvent and water. The sulfonic acid of Miura would function as a solvent in a water-containing bath in the same manner as the organic solvent of applicant in the presence of water. At page 13, applicant argues that neither Zhao et al nor Miura et al teach a non-ionic conducting organic solution (lines 5-6) and that the present invention is a method of forming a deposit on a substrate from a non-ionic conducting organic solution. This argument is not convincing because claim 1 does not recite a non-ionic conducting organic solution.

18. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will

the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William T. Leader whose telephone number is 571-272-1245. The examiner can normally be reached on Mondays-Thursdays and alternate Fridays, 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Susy Tsang-Foster can be reached on 571-272-1293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.


Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

Application/Control Number:
10/799,905
Art Unit: 1795

Page 10

Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Harry D. Wilkins, III/
Harry D. Wilkins, III
Primary Examiner
Art Unit 1795


William Leader
December 20, 2007